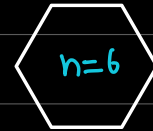
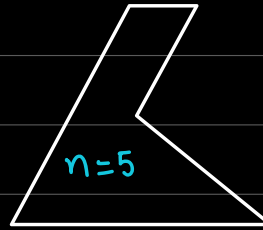
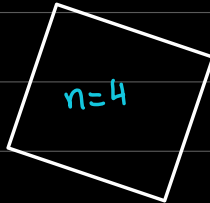
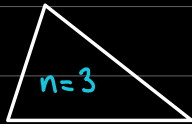


POLYGONS

MANY Angles



No of sides = n

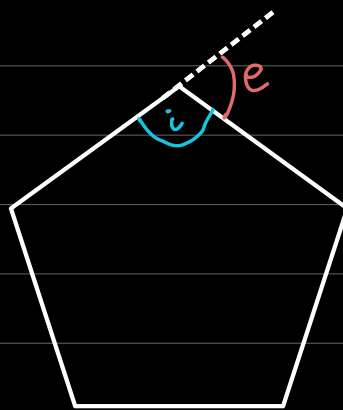
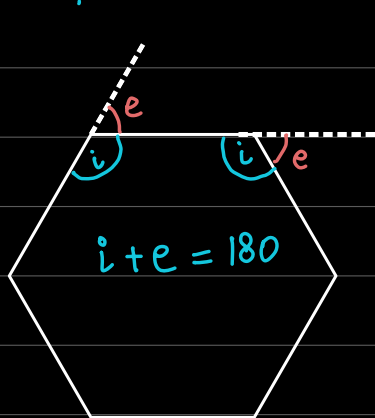
SIDES	SHAPE
$n=3$	Triangle
$n=4$	QUADRILATERAL (ANY 4 SIDED SHAPE)
$n=5$	PENTAGONS
$n=6$	HEXAGON
$n=7$	HEPTAGON
$n=8$	OCTAGONS
$n=9$	NONAGON
$n=10$	DECAGON

REGULAR POLYGON

All sides equal
All angles equal

SIDES	REGULAR
$n=3$	EQUILATERAL TRIANGLE
$n=4$	SQUARE
$n=5$	REGULAR PENTAGON
$n=6$	REGULAR HEXAGON.
$\vdots$	

you cannot write
Regular Triangle or
Regular Quadrilateral
here.



i = interior angle
 e = exterior angle

$$i + e = 180$$

ON ALL POLYGONS
 (REGULAR & IRREGULAR)

Sum of all interior angles $= (n-2) \times 180$

eg: Triangle : $(3-2) \times 180 = 1 \times 180 = 180$

Quadrilateral : $(4-2) \times 180 = 2 \times 180 = 360$

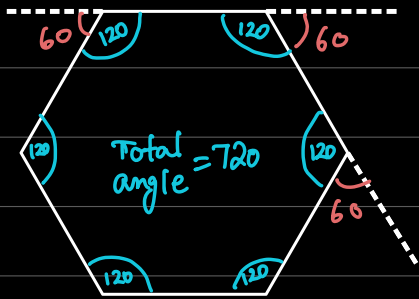
Pentagon : $(5-2) \times 180 = 3 \times 180 = 540$

Sum of all exterior angles $= 360$

ONLY REGULAR POLYGONS

Each Interior angle $= \frac{(n-2) \times 180}{n}$

Each exterior angle $= \frac{360}{n}$



This is a regular hexagon.

(i) Sum of all interior angles: $(n-2) \times 180 = (6-2) \times 180 = 720$

(ii) Each interior angle: $\frac{(n-2) \times 180}{n} = \frac{(6-2) \times 180}{6} = \frac{720}{6} = 120$

(iii) Each exterior angle: $\frac{360}{n} = \frac{360}{6} = 60$

- 3 (a) Three of the angles of a quadrilateral are each 95° .
Find the fourth angle.

- (b) Each interior angle of a regular polygon is 165° .
How many sides has the polygon?

$$\text{Each interior angle} = \frac{(n-2) \times 180}{n}$$

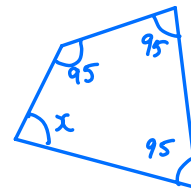
$$165 = \frac{(n-2) \times 180}{n}$$

$$165n = 180n - 360$$

$$360 = 180n - 165n$$

$$360 = 15n$$

$$n = \frac{360}{15} = 24$$



$$95 + 95 + 95 + x = 360$$

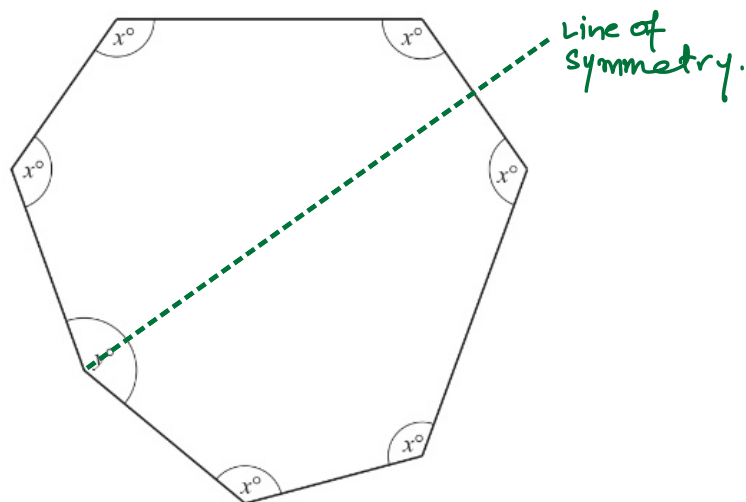
$$x = 360 - 285$$

$$x = 75$$

Answer (a) 75 [1]

(b) 24 [2]

- 5 The 7 sided polygon in the diagram has 6 angles of x° and one of y° .



- (a) Draw the line of symmetry on the diagram.

[1]

- (b) If $y = 126$, calculate the value of x .

$$\begin{aligned} \text{Sum of all interior angles} &= (n-2) \times 180 \\ &= (7-2) \times 180 \\ &= 900 \end{aligned}$$

$$y + 6x = 900$$

$$126 + 6x = 900$$

$$6x = 900 - 126$$

$$6x = 774$$

$$x = \frac{774}{6} = 129.$$

Answer (b) $x = \dots\dots\dots$ [2]

14 A regular polygon has interior angles of 160° .

(a) Calculate the number of sides of the polygon.

$$\text{Each interior angle} = \frac{(n-2) \times 180}{n}$$

$$160 = \frac{(n-2) \times 180}{n}$$

$$160n = 180n - 360$$

$$360 = 180n - 160n$$

$$360 = 20n$$

$$n = \frac{360}{20} = 18 \text{ sides.}$$

Answer [2]